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**Assessing distribution and conservation status of new grasshopper
species *Parapterotiltus minimoides* in the Sacred forests of the
Western Highlands of Cameroon**



Preliminary report

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Background

Parapterotiltus minimoides is a flightless grasshopper species with limited distribution and very low dispersal ability. Only 17 specimens of this very rare species have been collected since its description by Oumarou-Ngoute and Rowell in 2024, which suggests that it has a specialized ecological niche in forests. Intensive investigation is being conducted in the Bangoulap sacred Forest, where the presence of the target species has been confirmed, and in the localities of Baboné and Fotouni as well as the Mts. Manengouba and Bamboutos, where its presence is suspected. The forests of these localities and mountains are being converted for agricultural use and settlement (Gonwouo, 2009). Due to the accelerated rate of deforestation, the population of the target species could become increasingly fragmented and decline at an alarming rate, which could easily result in its extinction. Given the threats faced by this species, it is crucial to urgently plan conservation strategies. Effective conservation measures require an in-depth understanding of the ecological requirements, distribution, and threats faced by species.

Unfortunately, such information is lacking for our target species, which was recently discovered. Therefore, this project is intended to provide baseline data to establish the conservation status and program management plan for *P. minimoides* in the Bangoulap Sacred Forest. Specifically, we intend to (1) Estimate the population size and occurrence of the target species; (2) Characterize the vegetation formations of the survey area to determine *P. minimoides* habitat preferences; (3) Assess the actual distribution range of the target species based on GPS coordinates recorded; (4) identify and record all the threats associated with this species in the study area; and (5) Raise awareness campaigns about the importance of *P. minimoides* conservation.

Materials and methods

Study site

The Bangoulap Sacred Forests, as well as other Sacred Forests of West region of Cameroon are considered as non-protected areas. However, these Sacred Forests, located in high altitude areas, are widely known for their high level of biodiversity and endemism and they are considered to host many hotspots of biodiversity. They represent the only examples of the forest



element in the areas where anthropogenic pressures (agricultural expansion, agrochemicals, logging, and livestock grazing) are growing (Myers et al., 2000; Nkembu et al., 2021). Notwithstanding the high biodiversity and endemism, Sacred Forests are nowadays subjected to intense human pressures, which can pave way to their complete disappearance. This constitutes the main threat to the wingless species such as the target species *P. minimoides*, which has a very restricted distribution and specialized to forest habitats exclusively. The Bangoulap Sacred Forests has a humid tropical climate, with average annual temperatures ranging from 20 to 25 °C. Precipitation is abundant, with average annual rainfall ranging from 1,500 to 2,000 mm. The region experiences two main seasons: a rainy season from March to October and a dry season from November to February (Séguin, 1972).

Methods

Regular sampling is carried out monthly in the Bangoulap Sacred Forests, where grasshoppers are collected using sweep nets (Launois, 1984). Sampling takes place over a period of 60 minutes per day, between 10 a.m. and 4 p.m. (Yetchom-Fondjo et al., 2020), with samples identified in situ, marked, and released. All specimens found are photographed in their natural habitat using a digital camera, and the geographical coordinates are recorded using a GPS.



Figure 1: The sampling method used in the field. a): the principal investigator using sweep net to capture grasshoppers, b): the field assistant taking a picture of the target species, c & d): marked and released target species.

During the trek, the data on anthropogenic activities in each habitat are collected. The GPS coordinates of each threat are recorded and classified according to the IUCN Threat Classification System categories and levels (IUCN 2025). After the collection of the target species in each habitat, some parameters such as canopy cover, visibility, undergrowth, and slope are recorded in order to determine the habitat preference.

Preliminary results

Estimate the population size and assess the distribution range of the target species

From 29th July to 1st October 2025, we investigated the Bangoulap Sacred Forests. In addition to this study site, we also conducted field trips in two localities in the West region (namely Baboné and Fotouni) and two mountains (Mts. Manengouba and Bamboutos) to have an overview of the distribution of the target species across the West Cameroon Highlands. Out of

the five investigated study sites, *P. minimoides* was observed only in the Bangoulap Sacred Forests (Fig.2). However, we expect to observed the target species in the others sites by the end of the project.



Figure 2: Male (a), female (b), and couple (c) of *Parapterotiltus minimoides* collected in the sacred forest of Bangoulap.

Regarding the localities of Baboné and Fotouni, the species found in these areas was *Parapterotiltus bamboutos* (Fig. 3).



Figure 3: Males (a&b) and females (c&d) of *Parapterotiltus bamboutos* collected in the localities of Fotouni and Baboné.

We also collected *Pterotiltus inuncatus* in the Baboné locality (Fig. 4).



Figure 4: Male of *Pterotiltus inuncatus* collected in the locality of Baboné.

. The species found in the Mt. Manengouba is *Parapterotiltus minimus* (Fig. 5).



Figure 5: Male (a) and female (b&c) of *Parapterotiltus minimus* collected in the Mt. Manengouba.

Due to the high level of anthropogenic activity on Mt. Bamboutos, no species of the genus *Parapterotiltus* or *Pterotiltus* were collected at this time.

Determining the population size using a mark-recapture method

The estimation of the population size of the target species was based on the capture-mark-recapture method. The table below provides a summary of the number of individuals collected at each study site.

Table 1: Number of individuals collected in each habitat

Species	Sites									
	Mt. Manengouba		Mt. Bamboutos		Baboné		Bangoulap		Fotouni	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
<i>Parapterotiltus minimoides</i>	0	0	0	0	0	0	20	13	0	0
<i>Parapterotiltus minimus</i>	92	74	0	0	0	0	0	0	0	0
<i>Pterotiltus inuncatus</i>	0	0	0	0	5	3	0	0	0	0
<i>Parapterotiltus bamboutos</i>	0	0	0	0	15	12	0	0	32	22

Threats to target species in the study area

Until now, we have observed several anthropogenic practices that threaten the target species in the study areas. The major activities leading to the degradation of the forest cover and which could have a negative effect on the target species populations are agricultural practices, the use of pesticides and pastoralism (Fig. 6).



Figure 6: Anthropogenic activities record in the study area. a): agriculture, b): pesticides bottle used, c): pastoralism.

Habitat characterization

During fieldwork, many habitats were surveyed and those where the target species were collected were characterized. These were: grasslands, wet mountain forests, mountain forests, and agrosystems (Fig. 7).



Figure 7: Some habitats prospected during the sampling period. a&b): grasslands, c&d): mountain forests in a humid area, e): mountain forests, f): agrosystems.

References

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